UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,255	06/09/2006	Takeshi Kawamura	053549	8674

38834 7590 04/14/2011

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP
1250 CONNECTICUT AVENUE, NW
SUITE 700
WASHINGTON, DC 20036

EXAMINER	
JACOBS, TODD D	

ART UNIT	PAPER NUMBER
3746	

NOTIFICATION DATE	DELIVERY MODE
04/14/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentmail@whda.com

Office Action Summary	Application No.	Applicant(s)	
	10/563,255	KAWAMURA ET AL.	
	Examiner	Art Unit	
	TODD D. JACOBS	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 March 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) *7* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8 and 9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the entry dated 3/14/2011 and considers all proposed amendments/arguments.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuramoto (2004/0081565) in further view of Hall et al (6,708,981)

3. In re claims 1, 4, Kuramoto discloses an evacuation apparatus comprising: a booster pump (61) connected to a vacuum chamber (65), has a different pressure than the exit; and a main pump (11) connected to said first booster pump, having a pair of multistage pump rotors; wherein said main pump is arranged downstream of said booster pump and wherein the booster pump has a pumping speed high enough to increase a pumping speed of said main pump. However, Kuramoto, while disclosing a main pump being a multi-stage Root pump, fails to disclose the booster pump with more than one stage as a Root pump. Nevertheless, Hall discloses that booster pumps too can be multi-stage; see col 3 lines 49-58 where Hall discloses that the booster pump could be multi-stage. This would allow Kuramoto to have its booster pump be multi-stage just as its main pump is multi-stage in order to have efficient pumping and/or higher capacity out of the booster. Also, with multiple stages, the more stages for the same pressure brings a smaller pressure differential across each stage and reduced leakage. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the

invention to form the booster pump multi-stage just as the main pump because as taught by Hall using a multi-stage booster can also create advantages (see above) for the pumping apparatus.

4. In re claim 4, Kuramoto discloses wherein the rotational speed of the rotors is controlled based on current flowing into a motor for rotating the pump rotors (for example, the rotors are controlled to move faster when starting up based on the current input).

5. Claims 2, 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuramoto/Hall as discussed above, in view of either Weatherston et al (USP 3,667,874, hereinafter referred to as "Weatherston'874") or Weatherston (USP 3,922,117, hereinafter referred to as "Weatherston'117").

6. In re claims 2, 8-9 Kuramoto discloses an evacuation apparatus according to claim 1, but fails to disclose wherein each of said multistage pump rotors has an inlet-side rotor and an outlet-side rotor, and an axial width of said inlet-side rotor is larger than an axial width of said outlet-side rotor. Nevertheless, Weatherston'874 and Weatherston'117 both teach wherein there are inlet and outlet side rotors and wherein the inlet side has a larger width than the outlet side (see each side of the partition 16 between the rotors of Weatherston'117; also see each rotor on the side of the partition 38 of Weatherston'874). As stated in Weatherston'874 col 1 lines 25-30, using two stages enhances the efficiency of the compressor. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Kuramoto or Kuramoto/Hall with Weatherston'874 or Weatherston'117 in order to improve efficiency in the Roots pump (specifically the booster pump) of Kuramoto.

7. However, in regard to claims 8-9, the above combination fails to disclose the exact ratio between the two stages. Nevertheless, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use an inlet-side rotor width to outlet side rotor with ratio being between 5:1 and 10:1, since it has been held

that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Please note that in the instant application, applicant has not disclosed any criticality for the claimed limitations.

8. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuramoto/Hall as discussed above, in view of either Crinquette et al (4,887,941) or Morgan et al (4,850,806).

9. In re claims 3-4, (and as far as claim 4, without taking away from the above) Kuramoto discloses an evacuation apparatus according to claim 1, but fails to disclose wherein said first vacuum pump is started after said second vacuum pump is started. Nevertheless, Crinquette and Morgan disclose that it is known that similar arrangements can involve starting a primary pump, then later starting the secondary pump. See col 2 lines 1-7 of Morgan and see col 1 lines 16-23 of Crinquette, also note that claim 4 of Crinquette states that this ensures a more effective starting condition for the series-connected pumps. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Kuramoto or Kuramoto/Hall in view of Crinquette or Morgan to start the primary pump first, and then later start the booster pump, in order to ensure an effective starting condition of the pump. With specific regard to claim 4, Crinquette and Morgan both disclose that the rotational speed of the rotor is based on the pressure of the gas (Morgan col 2 line 3; Crinquette col 2 line 66).

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuramoto/Hall as discussed above, in view of either Baubron (4,442,353) or Becker (5,584,669).

11. In re claim 5, Kuramoto fails to disclose an evacuating apparatus according to claim 1 wherein said first vacuum pump and said second vacuum pump are accommodated in a single enclosure. Nevertheless, Baubron discloses an enclosure (11) covering multiple pumps

(including vacuum pumps 28, 13). Becker discloses a similar enclosure disclosed on col 5, lines 28-30 of Becker, "the turbomolecular pump and the two-stage positive displacement pump can of course also be accommodated in a common housing (not shown)". These housings help to both organize and protect the assembly. Therefore, it would have been obvious to one having ordinary skill at the time of the invention to modify Kuramoto or Kuramoto/Hall in view of Baubron or Becker in order to add a common housing which would both organize and protect the pumping system.

12. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuramoto/Hall as discussed above, in view of Miura et al (6,056,510).

13. In re claim 6, Kuramoto discloses an evacuation apparatus according to claim 1, but fails to disclose wherein each motor is a brushless DC motor. Nevertheless, Miura discloses, while using multiple vacuum pumps in series, using brushless DC motors (motors 5, 6, 7, 8) for each pump. Brushless DC motors are a known motor to improve efficiency of a given system. Therefore, it would have been obvious to one having ordinary skill in the art to modify Kuramoto or Kuramoto/Hall in view of Miura in order to have brushless DC motors, giving higher efficiency for the system.

Response to Arguments

14. Applicant's arguments with respect to the claims have been considered but are not persuasive. Applicant argues that the alternate USC 103 rejection is not valid because the primary reference "teaches away". However, examiner disagrees that Kuramoto teaches away from a potential multi-stage booster pump. Indeed, even though Kuramoto doesn't use a multi-stage booster pump, the reference never specifically prohibits multi-stage pumps to be used as discussed above. Applicant points out that using such a multistage pump would not allow the pump of Kuramoto to increase temperature as much, and this goes against the object of

Kuramoto. However, examiner notes that even if this were true, the pump of Kuramoto would yield a new advantage, which includes those advantages gained by using a two stage pump as discussed above.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Shibayama et al (2004/0173312) discloses multi-stage Roots pump. Yanagisawa et al (5,846,062) discloses a multistage pump not using roots rotors. Vermoesen et al (2005/0074353) discloses a multi-stage booster pump.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TODD D. JACOBS whose telephone number is 571-270-5708. The examiner can normally be reached on Monday - Friday, 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Charles G Freay/
Primary Examiner, Art Unit 3746

/TODD D. JACOBS/
Examiner, Art Unit 3746